

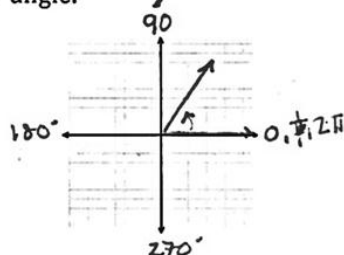
Name: Key to Understanding TP: \_\_\_\_\_

HW 61H: Angles & Radian Measure  
Due Wednesday, Feb. 6<sup>th</sup>  
Honors Geometry

Failure to show all work will result in a LaSalle.

Use a separate sheet of paper if necessary.

1) Draw a  $50^\circ$  angle.



a. Find one positive angle that is coterminal with the given angle.

$$50^\circ + 360^\circ = 410^\circ$$

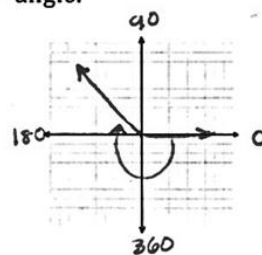
b. Find one negative angle that is coterminal with the given angle.

$$50^\circ - 360^\circ = -310^\circ$$

c. Convert  $50^\circ$  to radians.

$$50 \times \frac{\pi}{180} = \frac{5\pi}{18} \approx .873 \text{ rad.}$$

2) Draw a  $-230^\circ$  angle.



a. Find one positive angle that is coterminal with the given angle.

$$-230^\circ + 360^\circ = 130^\circ$$

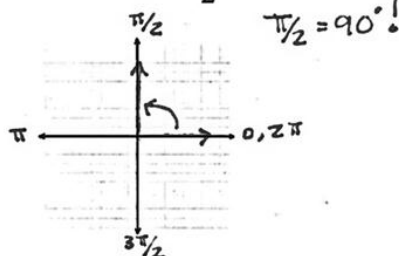
b. Find one negative angle that is coterminal with the given angle.

$$-230^\circ - 360^\circ = -590^\circ$$

c. Convert  $-230^\circ$  to radians.

$$-230^\circ \times \frac{\pi}{180} = -\frac{23\pi}{18} \approx -4.014 \text{ rad.}$$

3) Draw an angle that measures  $\frac{\pi}{2}$  radians.



a. Find one positive angle that is coterminal with the given angle.

$$\frac{\pi}{2} + \frac{2\pi}{1} \times 2 = \frac{5\pi}{2}$$

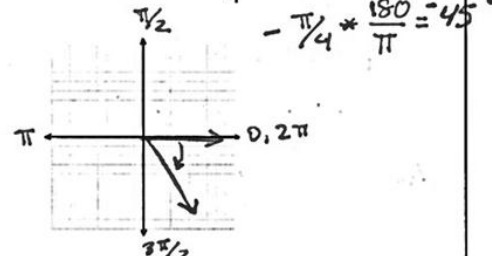
b. Find one negative angle that is coterminal with the given angle.

$$\frac{\pi}{2} - \frac{2\pi}{1} \times 2 = -\frac{3\pi}{2}$$

c. Convert  $\frac{\pi}{2}$  radians to degrees.

$$\frac{\pi}{2} \times \frac{180}{\pi} = 90^\circ$$

4) Draw an angle that measures  $-\frac{\pi}{4}$  radians.



a. Find one positive angle that is coterminal with the given angle.

$$-\frac{\pi}{4} + \frac{2\pi}{1} \times 4 = \frac{7\pi}{4}$$

b. Find one negative angle that is coterminal with the given angle.

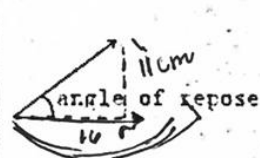
$$-\frac{\pi}{4} - \frac{2\pi}{1} \times 4 = -\frac{9\pi}{4}$$

c. Convert  $-\frac{\pi}{4}$  radians to degrees.

$$-\frac{\pi}{4} \times \frac{180}{\pi} = -45^\circ$$

**READ ME!** : Answer PRACTICE QUIZ questions to the best of your ability. Draw a ★ = easy, ■ = medium, ● = hard.

6) The angle of repose is the steepest angle at which dry, unconsolidated sediment is stable. You create a conical pile of sand that is as steep as you can make it. The pile is 11 cm high and has a radius of 16 cm. What is the angle of repose of this sand?

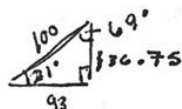


$$\tan x = \frac{11 \text{ cm}}{16 \text{ cm}} = .6875$$

$$= \tan^{-1}(.6875)$$

$$= 34.5^\circ \text{ angle of repose}$$

7) Given the approximation  $\cos 21^\circ \approx 0.93$ , use trigonometric identities to find the approximate value of:



a)  $\sin 21^\circ$   
 $100 \sin 21^\circ = 35.8$

b)  $\tan 21^\circ$   
 $93 \tan(21^\circ) = 35.7$

c)  $\cos 69^\circ$

d)  $\sin 69^\circ$

$100 \cos 69^\circ = 35.8$

$.93$

e)  $\tan 69^\circ$   $93 / \tan 69^\circ = 35.7$

8) If  $\tan \theta = 4$ , find the value of:

$$\tan \theta + \tan\left(\frac{\pi}{2} - \theta\right)$$

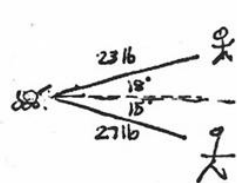
$$4 + \tan(90 - (\tan 4)^{-1}) = 4.25$$

9) If  $\sin \theta = 0.3$ , find the exact value of:

$$\sin \theta + \cos\left(\frac{\pi}{2} - \theta\right)$$

$$.3 + \cos(90 - (\sin .3)^{-1}) = .6$$

10) Combining Forces Juana and Diego Gonzales, ages six and four respectively, own a strong and stubborn puppy named Corporal. It is so hard to take Corporal for a walk that they devise a scheme to use two leashes. If Juana and Diego pull with forces of 23 lb. and 27 lb. at the angles shown in the figure, how hard is Corporal pulling if the puppy holds the children at a standstill?



$$23 \cos 18^\circ = 21.87$$

+

$$27 \cos 15^\circ = 26.08$$

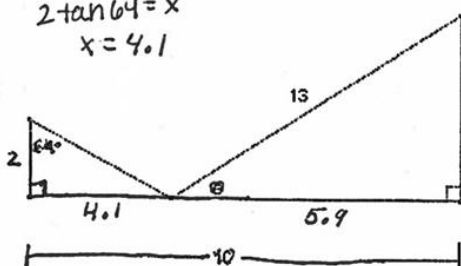
$$= 47.9 \text{ lbs}$$

11) Solve for  $\theta$

$$\tan 64^\circ = \frac{x}{2}$$

$$2 \tan 64^\circ = x$$

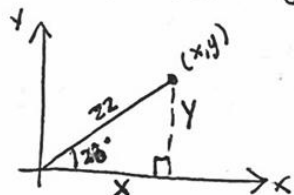
$$x = 4.1$$



$$\theta = \cos^{-1}\left(\frac{5.9}{13}\right)$$

$$\theta = 63.01^\circ$$

12) The distance from the origin to the point (x,y) in the 1st quadrant is 22. If the angle formed by the x-axis and the line that passes through the origin and point (x,y) is  $28^\circ$ , find the point (x,y).



$$\cos 28^\circ = x/22$$

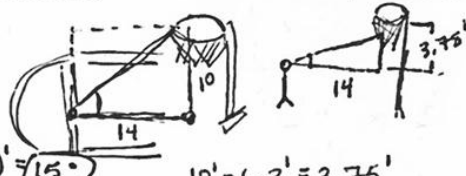
$$x = 19.42$$

$$\sin 28^\circ = y/22$$

$$y = 9.30$$

$$(19.42, 9.30)$$

13) A 6'3" basketball player stands at the foul line for a free throw. The distance from the free throw line to the point on the floor below the basket is 14'. If the height of the basket is 10', find the angle of elevation from the player's line of sight to the basket. Draw a picture to help you.



$$\tan\left(\frac{3.75}{14}\right) = 15^\circ$$

$$10' - 6.3' = 3.75'$$